KNOWLEDGE

NO. 148 VOLUME 13 The colour magazine which grows into an encyclopaedia EVERY MONDAY 2/-

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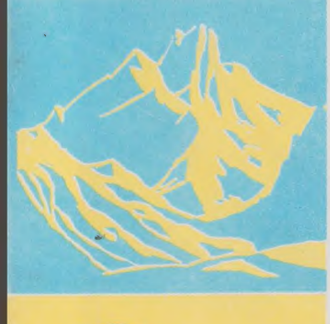

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A ARCHAEOLOGY (part two)

Excavating a barrow in Victorian times, from a drawing of 1844*; the methods of early excavators have now been greatly improved*

IN 1928 the great English archaeologist Sir Leonard Woolley was excavating a nunnery built about 550 B C at Ur of the Chaldees in Mesopotamia. On the floor of one of the rooms lay a limestone carving 1,500 years older than the nunnery. Not far away stood a boundary stone dating from about 1400 B C; almost touching it was a statue of Dungi, king of Ur in 2058 B C, and clay tablets written about 1700 B C. A stone mace on the floor was 2,200 years old.

Here were half a dozen objects lying on a floor of the 6th century B C, the newest of which was 700 years older than the pavement, the oldest 1,600 years. What were they doing there? A little way apart was a clay drum with columns of writing on it which explained that the objects had been found in the ruins of Ur. *The room had been a museum belonging to Princess Bel-Shalti-Nannar, and the clay drum was the earliest known museum label, recording excavations at Ur more than* 2,500 *years ago.*

Woolley's Ur excavations show archaeology at its most exciting and rewarding. Yet for many centuries archaeology had been little more than treasure hunting. The Norman monks building St Albans Abbey dug into the ruins of the Roman city of Verulamium to find bricks for their great church. The same monks some years later dug into Saxon barrows at Redbourn in Hertfordshire looking for the skeleton of St Amphibalus, with which they hoped to perform miracles. Later many Roman sites became quarries for building. The stone from Roman Aldborough was used for building turnpike roads in Yorkshire in the 18th century.

Previous page: Some of the wonderful objects discovered by Howard Carter in the tomb of the pharaoh Tutankh-amen, who reigned 1,400 years before Christ; (above) a reconstruction of a pharaoh's war chariot.

19th-century developments

Interest in excavations increased enormously in the 19th century, though for a long time method (if not enthusiasm) was lacking. At first people began to search for relics of their ancient ancestors. Barrows (burial mounds) were the main target of their attentions, and thousands were dug into by men like Thomas Bateman and Canon Greenwell in search of ancient urns and bones.

One archaeologist opened seven barrows in one day, and the Reverend Mr Skinner of Camerton opened six barrows in one afternoon. Today the same excavation would have taken about four months. The difference can be explained by the amount of information the archaeologist expects to gain from the barrow. The 19th-century digger was only interested in finding objects to display in his parlour or private museum. The modern archaeologist, on the other hand, is much more interested in finding out as much as possible about the people who built the barrow. If he digs scientifically he can usually find out when the barrow was made, what plants and trees were growing near it at the time, and what the general weather conditions were like. By examining any buried people that he uncovers he can find out how old they were at death, whether they suffered from any diseases, and if they died of old age, accident, or something more violent. Pottery or other objects in the barrow may give clues pointing to the origins of the burial and, more interesting, evidence of the kind of burial ceremonies that took place – funeral processions, dances, feasts, and so on.

It was only at the end of the last century, when General Pitt-Rivers applied his military precision to excavations, noting every

A view of the Saxon burial ship found at Sutton Hoo, after excavation; the lines of the timbers can clearly be seen on the sand

ELIZABETH FRY

THE prisons of early 19th-century England were dreadful places: men, women, and children were shut up together in filthy conditions, regardless of what crime they had committed. Debtors, thieves, murderers, and those waiting to be tried were all herded together like animals. Those who had money had food and liquor sent in to them; those who were poor starved. Many people thought that this was the right way to treat those who had broken the law, but others believed that it could only make criminals worse, and bring despair to those who might really want to lead a law-abiding life.

One of the people who tried to improve the prison system was Elizabeth Fry. She started in quite a small way – by reading the Bible to women prisoners in Newgate Gaol in London. From this small beginning her influence spread throughout the country, and throughout Europe. Now, with John Howard, she is regarded as a leader of prison reform.

Elizabeth was the third daughter of a family of 12 children, and was born in Norwich in 1780. Her father, John Gurney, was a merchant and a member of the Society of Friends, or Quakers as they are called. The Gurneys lived at Earlham Hall, and Elizabeth's early youth was full of fun and entertainment. But when she was 17 she heard the famous American preacher William Savery, and decided to become a 'Plain Friend'; this meant that she would wear the simple Quaker dress, give up all worldly pleasures like dancing, music, and the theatre, and would devote her life to charitable works. She believed that she had been called upon to serve her fellow men, and no argument or teasing from her family would make her change her mind.

In 1800 Elizabeth married Joseph Fry, who was also a Quaker. Although she had ten children she still found time for charitable work; she arranged schools for the poor, and collected and distributed food and clothes; and in 1811 she was made a 'minister' in the Society of Friends, an honour which meant a great deal to her.

Elizabeth Fry first visited Newgate Prison in 1813, and four years later she found time to carry out what seemed to her vitally necessary reforms: the separation of the sexes, the provision of schooling for the children, the classification of prisoners so that those awaiting trial were kept away from convicted criminals, and, above all, the attempt to bring about some sort of moral reformation among the prisoners.

Many people criticised the way in which visitors came to listen to Elizabeth Fry as she read the Bible to the women at Newgate. They thought that she was making it into some kind of entertainment, but Mrs Fry believed that such readings could do nothing but good to anyone who heard them, prisoners and visitors alike. It is true that her readings attracted attention, but this in itself brought the need for prison reform before the public, and made it easier for Mrs Fry to make her views known to the government and ask them to do something.

In 1818 Mrs Fry toured the prisons of England and Scotland and published her notes on this tour which, combined with the approval of the House of Commons committee on prison reform, led to a correspondence between her and people interested in prison reform in other parts of Europe. She later made several lengthy tours of the Continent, visiting prisons in many different countries and writing reports on conditions in them.

But it was not only prison reform which interested Mrs Fry. She tried to improve the terrible conditions on board the ships which took convicts out to Australia; she visited lunatic asylums and hospitals and campaigned to improve conditions in them too; she organised prison visiting; she set up a shelter for the homeless in London; and she started a library service for coastguards.

Towards the end of her life she became more and more worried about the new type of prison being built, in which the prisoners were to be kept in solitary confinement in separate cells. Bad as the old prisons were, Elizabeth Fry thought that the new ones offered even less hope to those who were shut up in them. But she was not able to continue the struggle. After a long illness she died in October 1845.

Elizabeth Fry reading to prisoners in Newgate; her readings attracted great attention, and many visitors came to hear them

PARIS (part two)

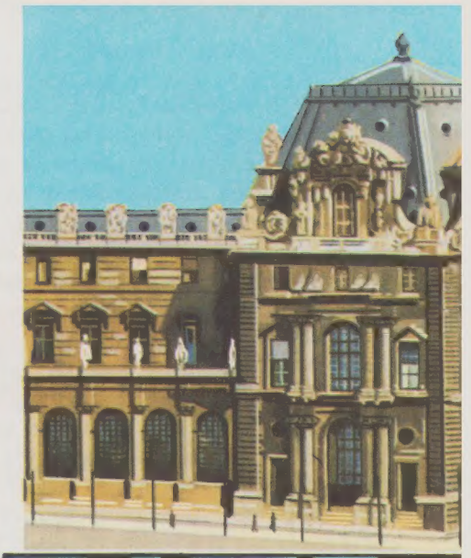
IN 1780 the Champs de Mars, the great open strip now straddled by the Eiffel Tower, was completed, and became the site of a series of international exhibitions. The Eiffel Tower is a relic of the exhibition of 1889. It was designed by the French engineer Alexandre Eiffel, to show the qualities of steel, and built largely at his own expense. It is made up of 12,000 separate pieces of steel, and it has been estimated that with modern engineering methods the same height could have been reached with about one-third the amount of metal. On 10th June 1889 Edward VII (then Prince of Wales) was the first person to take the lift up to the top of the tower.

In 1909 Eiffel's 20-year lease ran out, and the tower was going to be pulled down. It was saved by the invention of wireless, for there is now an important radio station on top. The addition of a radio and television mast has raised the height of the tower from its original 984 feet to 1,052 feet.

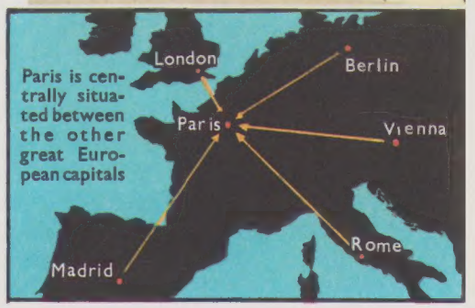
The Eiffel Tower, built in 1889, has become the symbol of modern Paris. Its top balcony offers a fabulous panoramic view over the whole city

The rebuilding of Paris

A Parisian of today would scarcely recognise the Paris of 1830. Many of the houses were then at least six centuries old. They were filthy; most of the water still came polluted from the Seine, and there were still open sewers in the older districts.



It was Louis Philippe who began the modernisation of Paris. His work was not on a large enough scale to accomplish much, but its beginnings were enthusiastically continued by Napoleon III and Baron Georges Haussmann, who completely transformed the face of Paris.



Few cities today owe so much to the ingenuity of one man, as does Paris to Baron Haussmann.

Napoleon III had spent five years in England where he had been greatly impressed by the planning and spaciousness of London. Much of mediaeval London had been destroyed by the Great Fire of 1666; and in contrast to Paris, London was then a model of cleanliness and modernity. Napoleon determined to make Paris the same, and in 1853 he appointed Haussmann Prefect of the Seine for this specific purpose.

The first problem was to finance the plan. This was overcome by making some of the suburban districts of Paris liable to the *octroi*, a duty levied on all goods entering the city. Haussmann then went ahead with his plans with startling rapidity. The whole city was opened up; the railway terminals were linked with immense new thoroughfares; trees were planted everywhere – Haussmann, in fact, had 75,000 planted. The creation of the great parks – the Bois de Boulogne and the Bois de Vincennes, ancient royal forests which were adapted for public use – was one of the most popular of his achievements.

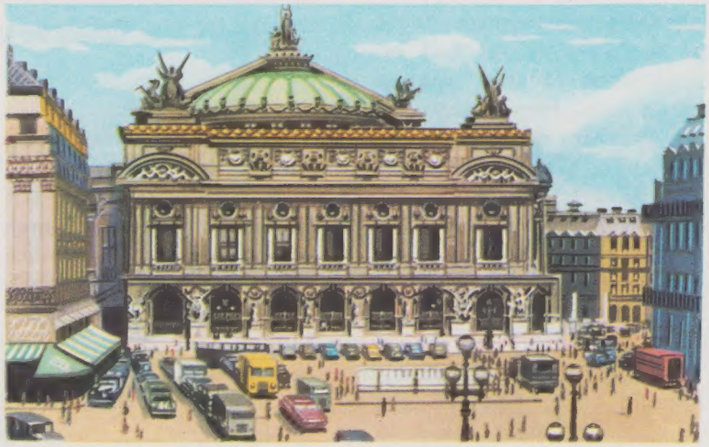
Great boulevards were cut through the old congested quarters, including some which are now among the most famous streets in Paris – boulevard St Germain, boulevard St Michel, and boulevard de Strasbourg. But the work for which Haussmann is best known was the construction of the Etoile. This is the star-shaped pattern of 12 broad avenues which radiate from Napoleon Bonaparte's Arc de Triomphe on the right bank of the Seine. Haussmann made this the focal point of his plan, and, designed by the architect Alphand, it was one of the most ambitious pieces of town planning in history.

At the time Haussmann was unfairly accused of making an enormous personal profit from his work. Later generations have condemned him for destroying some of the most picturesque and historic streets of Paris. But this was unavoidable. Although some of his districts with their endless geometrically planned avenues are monotonous, there are few people today who do not think Paris one of the finest cities in Europe. This was the happy result of handing over the creation of a modern capital to one man.

The enormous palace of the Louvre, perhaps the most famous museum in the world

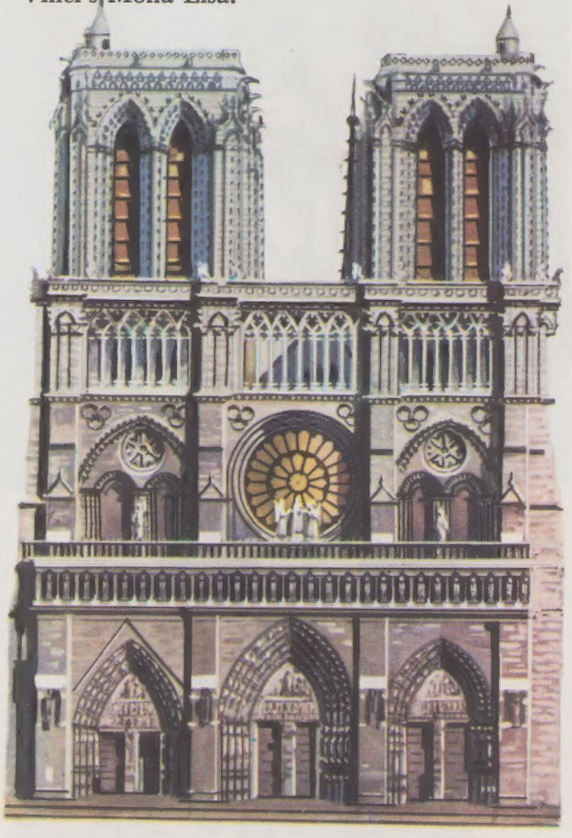
The Louvre. The Louvre, perhaps the most famous museum in the world, was once the residence of the kings of France, and before that only a simple storehouse. It has grown tremendously during the six centuries of its existence, and today it covers about half a mile of the right bank of the Seine. Philip Augustus built the first Louvre in the early 13th century. This was only a moderate-sized keep; Charles V enlarged it as a fortress; and Francis I and his successors embellished it as a palace, making it one of the finest French examples of Renaissance architecture. Henry IV introduced artists to the Louvre, providing them with lodgings in the long gallery and beginning the 'artistic' connections we associate with its name. Fragonard, Greuze, David, and a host of others lived in this part of the Louvre. However, Napoleon I turned the artists out and made the whole of the Louvre into a museum. Today it is the richest and largest museum in the world, and several weeks are needed to see properly all it contains. Among the most famous of all its treasured possessions are the Venus de Milo and Leonardo da Vinci's Mona Lisa.

The Théâtre de l'Opéra, built between 1861 and 1875 by the architect Charles Garnier



The church of Les Invalides designed by J. H. Mansard. Napoleon's tomb was placed here in 1840

Notre Dame de Paris. Notre Dame, the cathedral church of Paris, is on the Île de la Cité in the Seine. It is on the same site as a former Roman temple to Jupiter and a basilica of the Merovingian kings. Begun in 1163, it was virtually completed by about 1250. Its beautiful façade is outstanding. The kings of France were traditionally crowned at Rheims, but Henry VI of England was crowned at Notre Dame in 1431, as was Napoleon I in 1804. The cathedral has had a violent history. During the revolution of 1789 the interior was ransacked; the windows were left as gaping holes, and the vast nave fluttered with birds and bats. In 1845 restoration work began, but in the Communards' risings of 1871 the revolutionaries piled chairs in the nave and set them alight. Luckily the fire was quickly put out, and Notre Dame remains as one of the most visited and admired of French buildings.



DAVID AND SOLOMON

THE early history of the Jews was troubled and unhappy (see page 684). They were enslaved in Egypt and were led out by Moses to wander 40 years in the desert. When they finally reached Palestine, the Promised Land, in about 1400 B C, they were divided among themselves. Centuries of hardship followed, and persecution by the other tribes of Palestine; and in 587 B C they were conquered by the Babylonians. Afterwards they were enslaved by the Romans, and in A D 70 their Temple at Jerusalem was destroyed and the Jews were dispersed to wander without a home for nearly 1,900 years.

Yet for one brief period Jewish history was prosperous and glorious, for under their first kings – Saul and, above all, David and Solomon – the Jewish state became renowned for its magnificence, culture, and strength.

When the Jews, or Hebrews, reached Palestine under Joshua they were able to subdue the other tribes of the area and settle down. But they did not have things all their own way, for the powerful Philistines, as well as other tribes, began to regain their strength and threatened the Jews with destruction. It was fear of these tribes – Philistines, Edomites, Moabites, and others – which caused the Jews to proclaim their first king, Saul, in about 1025 B C. Yet despite his successful reign Saul was finally defeated by the Philistines, one reason being that the Jews as yet had no united front to offer against their enemies. They consisted of many different tribes like those of Reuben, Gad, Manasseh, Judah, Simeon, Dan, Benjamin, and others. The tribes often opposed each other, and in particular those of the north felt themselves at enmity with those of the south.

David victorious over Goliath; a bronze statue by Andrea Verrochio (1476; National Museum, Florence)

Saul came from the northern Benjamin tribe, and did not rule effectively over Judah in the south. It was his successor David from Judah who was the real founder of Israel. Driven out of Saul's court at Benjamin, David fled south and established himself as king of Hebron. Gradually he extended his authority over the south and eventually over the north as well. His kingdom was acknowledged by all the Jewish tribes who had settled in Palestine. About 1000 B C he conquered the city of Jerusalem from its inhabitants the Jebusites and subdued all the tribes which had harassed the Jews before his reign. He extended the boundaries of Israel to the Euphrates and the Red Sea.

King Solomon, surrounded by the splendours of his

The priesthood was elaborately reorganised. David was easily the greatest figure to sit on the royal throne in Israel. His son and successor Solomon was equally famous, and it was under Solomon that the magnificent Temple at Jerusalem was built. Solomon's wealth and extraordinary wisdom became a by-word in the Middle East. Schools of prophecy were built, and the arts of poetry, music, and architecture flourished. Nevertheless the unity of Israel brought about by David began to break down. Solomon's extravagance had made his people poor, and immediately after his death the split between the north and south opened once more. The north formed its own kingdom under Jeroboam, while Judah, with its capital still at Jerusalem, was ruled by Rehoboam, son of Solomon. The Jewish nation was never again to be so powerful, and suffered innumerable hardships before being conquered by Nebuchadnezzar in 587.

The Bible

In some ways the Bible is the most important history book ever written. The Old Testament tells the story of the Hebrews, the chosen people, and their preparation for the coming of the Messiah. The Jews believed that their history was entirely guided by God (Yahweh), who chose the kings, punished them if they disobeyed him, and rewarded them if they served him

court, receiving the Queen of Sheba who has come from Arabia, bearing gifts, in order to test his wisdom

faithfully. Now let us look at the Bible story of David and Solomon – the greatest of these kings.

Chosen by God

Samuel, the first of the prophets, was instructed by God to choose David as king. Saul had displeased God, who determined to deprive him of his kingdom. But at this time David was only a shepherd boy, and Samuel did not make God's decision and choice public.

David grew up to be renowned for his skill as a poet and for his harp playing, and Saul, who suffered from appalling fits of depression, sent for him to play at his court. He was so successful in charming away the king's moods with his playing that he became a favourite of the king and the friend of his son Jonathan.

At this time the neighbouring Philistines attacked the Jews, and their champion, a giant called Goliath, challenged the Jews to single combat. No one dared to oppose the huge, heavily armed man except David, who went out to meet him armed with a sling and a few pebbles. With his first shot he killed the giant. This made him enormously popular with the Jews, and Saul, who was jealous of him, sent him away. But God's retribution was at hand. Saul was killed by the Philistines and David became king.

David's reign was glorious. He gave due respect to the prophet Samuel and pleased God by his holiness and reverence for the priesthood. But he too angered God by having Bathsheba's husband killed so that he could marry her himself, and the end of his reign was clouded by tragedy. His son Absalom rose up against him, and during the ensuing battle Absalom's long hair caught in a tree under which he was riding and he was slain. David was grief-stricken, and mourned: 'O my son Absalom, my son, my son Absalom! would God I had died for thee, O Absalom, my son, my son!'

Solomon; a detail of a statue in Chartres cathedral, France

David died when he was about 70 and was succeeded by Solomon. God appeared to Solomon in a dream, and said: 'Ask what I shall give thee.' And Solomon said: 'Give therefore thy servant an understanding heart to judge thy people.' God then replied: 'Because thou hast asked this thing, and hast not asked for thyself long life; neither hast asked riches for thyself, nor hast asked the life of thine enemies; but hast asked for thyself understanding to discern judgement; behold, I have done according to thy words; lo, I have given thee a wise and an understanding heart; so that there was none like thee before thee, neither after thee shall any arise like unto thee. And I have also given thee that which thou hast not asked, both riches, and honour; so that there shall not be any among the kings like unto thee all thy days. And if thou wilt walk in my ways, to keep my statutes and my commandments as thy father David did walk, then I will lengthen thy days.'

But towards the end of his life Solomon turned away from God, and worshipped the false gods of the neighbouring tribes. Because of this, the kingdom was split on his death, leading to the decline of the nation.

The Bible describes in great detail the building of the Temple, and the many different materials used in it. Its magnificence, and the wisdom of Solomon, caused people to travel from hundreds of miles to listen to his judgements and talk with him; among them was the Queen of Sheba.

URANIUM

URANIUM was discovered in 1789 by the German chemist Klaproth, who isolated it from the ore *pitchblende*. The name uranium was given to this rare element to commemorate the discovery of the planet Uranus by Herschel in 1781. Klaproth thought he had obtained uranium metal, but it was later shown that he had only managed to obtain an oxide (UO_2), and the metal itself was not isolated until 1841.

MYSTERIOUS PROPERTIES

Klaproth showed that uranium salts produced a fine yellow or orange colour when added to glazes for pottery, and uranium compounds were used in small amounts as photographic chemicals in the 19th century. It was not, however, until 1896 that uranium, the heaviest natural element, became of any particular interest. In that year Henri Becquerel was investigating a number of fluorescent materials, among them a salt of uranium. One day Becquerel put a quantity of the uranium salt in a drawer which contained some photographic plates. Although the plates were wrapped in lightproof paper, Becquerel found to his surprise that when he came to develop them they were fogged, just as if they had been exposed to light. When he investigated this strange occurrence further he found that the uranium was responsible, and that uranium salts gave out radiation which would pass through solid materials and affect a photographic plate.

This property was christened radio-activity, and uranium was the first radioactive substance to be obtained. Later radium was also isolated from pitchblende where it occurs as a product of the radioactive breakdown of uranium.

ENERGY FROM URANIUM

The principal use of uranium today is as the fuel for nuclear power stations. In natural uranium, as it is extracted from its ore, there are mainly two types of atom or *isotopes* of uranium. One isotope, called U235, has 92 protons and 143 neutrons in its nucleus (235 particles in all); the other is U238, which has 92 protons and 146 neutrons. In natural uranium there are 140 U238 atoms to one U235 atom. Now if a nucleus of U235 is hit by a free neutron it can split into two parts of about equal weight – that is, it is *fissile* – and in addition it will give out two or three fast neutrons, together with a large amount of energy. U238 absorbs fast neutrons more easily, but it is not fissile. The neutron stays in the nucleus and a γ ray is emitted.

In a nuclear reactor the natural uranium is made into rods which are spaced apart with graphite blocks. These act as a *moderator*; that is, they slow down the neutrons from the U235 fission so that they are less likely to be absorbed and lost in the U238. It is also easier to split U235 with slow neutrons than with fast neutrons. The amount of U238, graphite, and other absorbers are arranged so that when each U235 nucleus splits, only one neutron out of the two or three produced succeeds in splitting another nucleus. This in turn gives out two or three neutrons, only one of which succeeds in splitting a further nucleus, and so on. In this way the number of nuclei splitting at any time remains constant. The reaction is kept under control, and the heat resulting from this *fission* process can be used to turn water into steam. The steam can then be used to drive a turbine to generate electricity.

Suppose we separate the U235 from the U238 and put sufficient pure U235 together. The first fission which occurs gives out, say, three neutrons which will all hit further U235 nuclei; these in turn will give out three neutrons each, making nine in all. These cause nine more nuclei to split and then 27, 81, 243, and so on. This type of reaction cannot be controlled and occurs extremely quickly with a tremendous sudden explosion of energy. This is the basis of the atomic bomb.

WHERE URANIUM IS FOUND

Many minerals contain some uranium, but the chief ores, which are illustrated on this page, are *uraninite* (UO_2 and UO_3 crystalline), *pitchblende* (mixed UO_2 and UO_3, black and pitchy), and *autunite* (a complex calcium uranyl phosphate). In the western world the chief deposits are in Canada, South Africa, United States, France, Australia, and the Congo. There are also important deposits in central Europe and in Russia.

PHYSICAL PROPERTIES

Atomic number	92
Atomic weight	238·07
Melting point	about 1,100°C
Boiling point	about 4,000°C
Density	19·04 g/cc

Uranium is both *ductile* (it can be drawn out into wire) and *malleable* (it can easily be shaped). In appearance it is a lustrous silver metal.

CHEMICAL PROPERTIES

Uranium metal is quite reactive. It will combine directly when hot with oxygen and with the halogens (fluorine, chlorine, bromine, and iodine). At 250°C–300°C it combines with hydrogen to form the *hydride* UH_3. With acids uranium forms tri- and tetravalent salts, and can also show a valency of five or six. Uranium hexafluoride (UF_6) is a low-boiling compound of importance in the separation of U235 from U238.

Hunting rabbits with the aid of a ferret, a method of hunting used for many centuries

THE WEASEL FAMILY

THERE are two men in the field; one of them is standing, holding a gun, alert and ready to shoot, the other is kneeling in front of a rabbit hole. In his hand he holds a yellowish-white animal a little bigger than a rat and very long in the body; as we watch he drops it at the entrance of the hole and it rapidly disappears from view. After about five minutes a rabbit suddenly shoots out of another hole a few yards away and races across the field. The man with the gun waits until it has run 20 yards or so and then shoots it.

This method of hunting rabbits has been practised from early historical times. The ferret, as the animal is called, is a domesticated form of the polecat, which is a deadly enemy of rabbits and all such small game. When rabbits are pursued underground by ferrets they run in panic out into the open. When they emerge they can either be shot, caught in nets that have been put over the holes, or they can be chased by dogs. Before the invention of efficient sporting guns the last method of hunting with a ferret was the most usual. The ferret is muzzled, because if it caught and killed a rabbit underground it would eat its fill and go to sleep there.

The Family of animals to which the ferret belongs is called the Mustelidae, and the weasel is the most familiar as well as the smallest of them. None of the mustelids is very large; the biggest of them, the wolverine, has a body about 3 feet long, while a weasel is hardly larger than a mouse. A few of the species are illustrated on the next two pages.

Some common mustelids

The **weasel** is one of the smallest of the mustelids, and females are much smaller than males. They feed largely on mice, and are common in Europe and western Asia.

Pine martens are wonderfully active climbers and live in pine and fir forests, preying on squirrels and birds.

The **sable** is very like a pine marten and lives in the northern parts of Asia. Its fur is very valuable.

The **ratel** or **honey badger** is an African animal, very strong and fearless, that likes to feed on wild bees' honey; it seems to care nothing for their stings.

The **wolverine** or **glutton** is the largest of all the Mustelidae, with a heavily built body 3 feet long. It lives in northern Europe, Asia, and North America.

The **polecat** is the wild ancestor of the ferret. It is found in Wales and over most of Europe and Asia.

Beech martens are very like pine martens in appearance and habits, and live in Europe and temperate parts of Asia.

The **ferret** is a domesticated polecat; most ferrets are albinos with yellowish-white fur and pink eyes.

Mink are fairly large mustelids, with bodies 2 feet long, and are very good swimmers. Their fur is valuable and they are farmed to provide skins for the fur trade.

The **zorille** is an African animal about as big as a ferret.

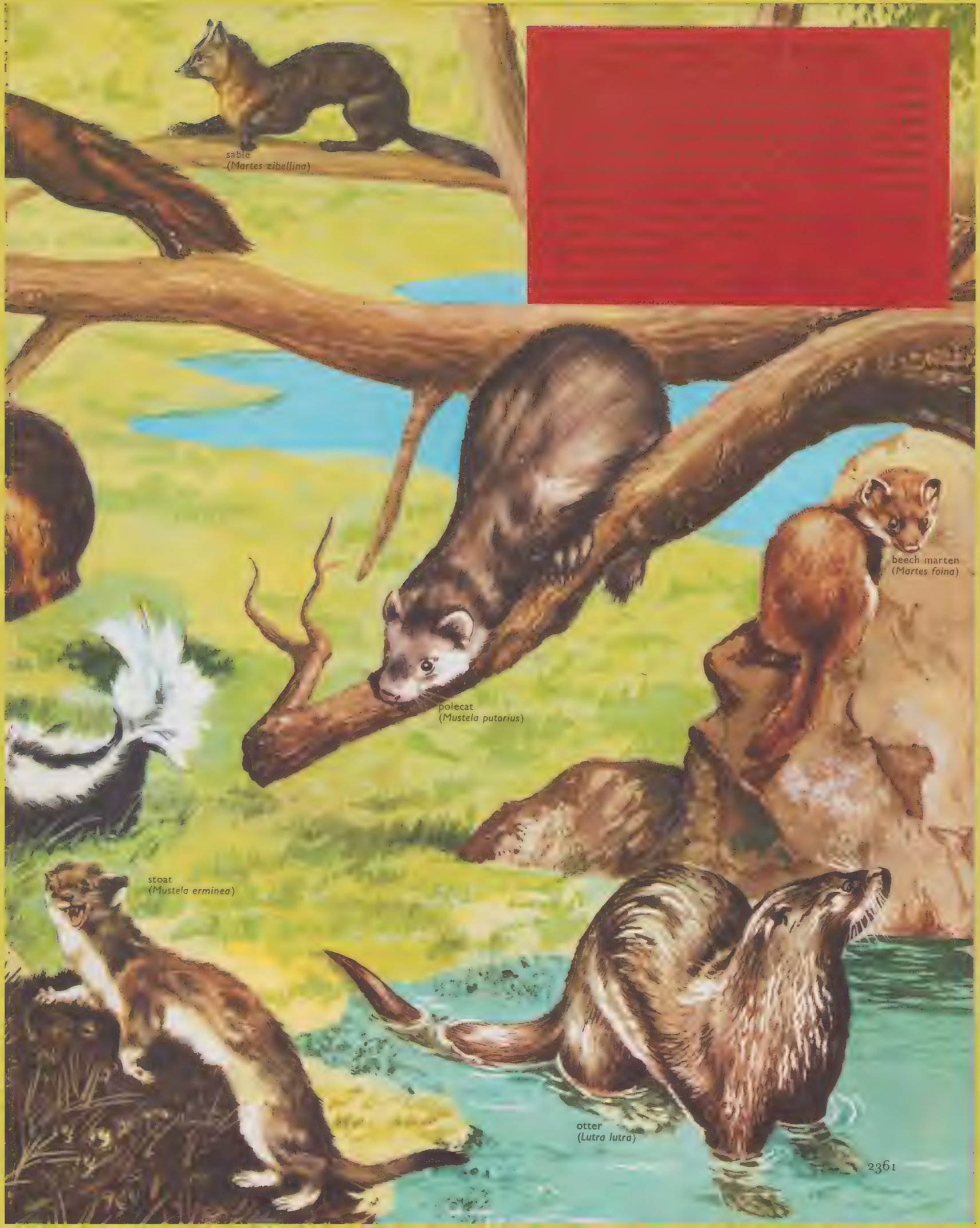
The **badger** is larger than most mustelids and very strong for its size. It is quite common in Britain, though seldom seen because it only comes out of its burrow at night.

Most mustelids have a strong unpleasant smell, but the North American **skunk** uses this feature as a weapon, ejecting a foetid, blinding liquid at its enemies.

The **stoat** is one of the most common of the weasel family. In the sub-arctic regions its coat turns white in winter, and it is then called an ermine.

Otters are the only truly aquatic mustelids and are wonderful swimmers; they feed mostly on fish. The common otter is found over most of Europe, including Britain.

NOTE: These animals are not drawn to a constant scale.


sable
(Martes zibellina)
polecat
(Mustela putorius)
beech marten
(Martes foina)
stoat
(Mustela erminea)
otter
(Lutra lutra)

The streets of Constantinople in the Middle Ages; traders from all over Europe pass through the

BYZANTINE CONSTANTINOPLE

Worker

MOST Europeans in the year AD 1000 had little idea of what a large city was like. What we would call a village, they called a town. And there were only two cities in the whole of Europe which today we might call fairly large towns; one was Rome, and the other was Constantinople or Byzantium, the present-day Istanbul.

Rome was in a state of decline – much of it was in ruins, and mud huts and hovels had appeared among the great palaces of what was once Europe's first city. But the same fate had not befallen the second city, Constantinople. Standing on the western bank of the Bosporus, the narrow channel which links the Black Sea with the Sea of Marmara, it had maintained much of the grandeur of imperial Rome.

The history of Constantinople began in AD 330 when Constantine made it the capital of the Roman Empire, meaning it to be 'the new Rome'. The original name Byzantium was changed to Constantinople, or 'city (*polis*) of Constantine'. Constantinople rapidly doubled its size. In 395 the Roman Empire was divided into two halves – the Western Roman Empire and the Eastern Roman or Byzantine Empire (see page 562) – and Constantinople became the capital of the latter.

During the 5th century new fortifications were built which remained the foundation of Constantinople's land defence throughout the Middle Ages, and can still be seen today. The building of the fortifications came none too soon. In the middle of the century the Huns came sweeping through Greece, but were stopped by the great walls of the city. To the barbarians, who had come for plunder, the sight of the golden domes glittering behind the immense walls must have been tantalising, but they had to retreat, and the same fate was suffered by all other attackers in the next 750 years. In 626 the Persians and Avars were driven back. Between 668 and 782 three attacks by the Arabs were repulsed, and between 865 and 1043 the Vikings of Russia tried four times in vain to capture the richest prize in the western world. Later, Turks and Bulgarians were also thwarted by the walls of Constantinople.

Courtier

A mediaeval trading centre

The hey-day of Constantinople was before 1200. With Kiev in Russia, and Venice and Pavia in Italy, it was on the main stream of European trade. The Vikings brought furs down from Russia and returned with the silks and spices of the East. European merchants like the Venetians established trading posts along the Golden Horn, Constantinople's huge harbour. The Byzantine currency, the golden *byzant*, was never seriously devalued, and in the early Middle Ages was sought after in much the same way as the pound sterling was in the 19th century and the dollar not so long ago.

No city in Europe or the Middle East, except Baghdad, could compare with Constantinople in magnificence – with its streets of rich palaces and public buildings, and numerous churches with golden domes flashing in the sun; dominating everything was the huge cathedral of Sancta Sophia, built in the 6th century by the Emperor Justinian (see page 84), and the huge Hippodrome where horse-races were held. There were also vast water tanks which gave Constantinople one of the most abundant water supplies in the world. In this period the city covered about nine square miles.

Soldier

Priest

city, exchanging their merchandise for goods brought from the East and from Russia

Soldier

But all was not splendour. In the 8th and 9th centuries the Iconoclasts, a sect who broke religious images, had done much damage to works of art. As in many great eastern cities, poverty was never very far from the surface, although Constantinople did have an advanced poor-law organisation. Like Rome, it had hovels; but, unlike Rome, Constantinople was in the centre of the civilised world. Numerous different peoples from both East and West passed over its drawbridges and through its seven gates.

Europeans had for some time eyed this great city with wonder. In the 10th century Liutprand, Bishop of Cremona, arrived there on a mission of the German Emperor, who was despised by the Byzantines as an uncultured upstart. While ready to see the worst in Constantinople, Liutprand could not help being impressed by its splendours, even noting with fascination the zoological gardens.

But Europeans were soon gazing with greed as well as wonder at Constantinople. In the 11th century the Normans of south Italy set their sights on it but never took it. In the next century Henry VI, the Hohenstaufen emperor, fitted out a great fleet to capture it but died before it could sail.

The capture of Constantinople

It was only at the beginning of the 13th century that Constantinople was taken for the first time in its history. The greed and cunning of the Venetians helped to deflect the Fourth Crusade from the Holy Land to the Byzantine Empire, which was at this moment going through a period of decline and was thus a tempting prize. In 1204 the crusaders stormed the walls, and after a half-hearted defence Constantinople was taken. The crusaders went wild. They plundered the palaces and churches, taking anything of value they could lay their hands on in a fit of almost insane greed. One ecclesiastic wrote home to his monastery saying that he had had the good luck to obtain many relics including a 'not inconsiderable piece of St John the Baptist'. Greek Orthodox Christians were long to remember the horrors of this sack.

The Latin Empire which replaced the Byzantine Empire did not last long, and by the end of the century the Byzantine Emperors had been restored. The ruling family was now the Palaeologi, who showed considerable vigour. Although much of the magnificence of Constantinople had vanished with the sack of 1204, the city was, at the beginning of the 15th century, still three times the size of London at this time. The Greek Manuel Chrysoloras, writing in this period to the Emperor John Palaeologus, gives an interesting picture of the city just 50 years before its doom.

'Constantinople,' he writes, 'is situated on a commanding point between Europe and Asia. . . . By her interposition the two seas and the two continents are united for the common benefit of nations; and the gates of commerce may be shut or opened at her command. The harbour, encompassed on all sides by the sea and the continent, is the most secure and capacious in the world. The walls and gates of Constantinople may be compared with those of Babylon: the towers are many; each tower is a solid and lofty structure; and the second wall, the outer fortification, would be sufficient for the defence and dignity of an ordinary capital.'

Constantinople's doom was approaching in the form of the Ottoman Turks. Even the thousand-year-old walls could not save the city, and on 29th May 1453 Constantinople fell. The Roman Empire had ended after a history of nearly 1,500 years.

Today Constantinople is called Istanbul; this is the largest city in Turkey, and ten times the size of what was once the greatest city in Europe.

Bishop

Emperor

Empress

BARBADOS

BARBADOS is the most easterly of the Caribbean islands and lies out in the Atlantic, aloof from the West Indies Windward group, some 200 miles north-east of Trinidad and the coast of South America. It is 3,622 miles from Liverpool and 1,825 miles from New York.

Barbados is a small, pear-shaped island about the size of the Isle of Wight, 21 miles long by 14 miles wide at its widest point, with an area of 166 miles. Its population is about 242,000; the people are English speaking and most of them are coloured. The density of the population – 1,458 to the square mile – is uncomfortably high, and it is difficult for everyone to make an adequate living from the island.

Coral reefs encircle the island, which rises gently to Mount Hillaby in the Scotland district, the highest point, which is 1,104 feet above sea-level. On the Caribbean coast are narrow stretches of dazzling silver sands, fringed with feathery casuarinas and shady coconut palms, lapped by a calm sea; while the Atlantic shores have rocky cliffs and wide, boulder-strewn beaches, swept by an invigorating wind, and pounded by great Atlantic rollers.

Although Barbados is in the Tropics it is fanned by the prevailing north-east trade winds between December and June, and has a very pleasant climate. The thermometer never rises above 87°F, even in midsummer, and seldom drops below 70°F in the winter months, while the temperature of the sea around it remains about 75°F. Rainfall, which mostly occurs between June and December, varies from 50 inches on the coast to about 75 inches in the hills.

Early inhabitants

The first inhabitants of Barbados were the Arawaks, a peace-loving agricultural race of South American Indians who penetrated the islands of the Caribbean in about 600 B C, travelling as far north as the Bahamas. In the 15th century another race of Indians, the fierce and warlike Caribs from Paraguay, swept over the whole area. They persistently raided the Arawak settlements in Barbados, until they finally drove out these first inhabitants. Though the Caribs did not settle in Barbados permanently they used the island for fishing, hunting, and for the celebration of their religious rites.

Loading sugar cane which is grown over most of the island

The first white man to set foot on Barbadian soil was a Portuguese sea captain, Pedro à Campos, who 'discovered' the island on a voyage to Brazil in 1536. He named it *Los Barbudos*, the bearded ones, after the beard-like aerial roots hanging from the island's fig trees. He found the island uninhabited, and sailed away, thoughtfully leaving a number of pigs to breed there to provide food for those, less fortunate than himself, who might be shipwrecked on its shores.

'Little England'

In 1625 the crew of the English ship *Olive Branch* took possession of the island for Britain, erecting a cross and nailing to it a notice that Barbados now belonged to 'James, K. of E. and of this Island'. On his return to England the ship's captain reported this to his employer, Sir William Courteen, who financed an expedition to Barbados. It reached the island in 1627, and its 40 members founded the first settlement, which they called Jamestown in memory of King James I. From that day to this Barbados has never changed hands, remaining, throughout the long fight between English, Spanish, French, and Dutch for supremacy in the West Indies, uninterruptedly and staunchly British, both in character and way of life. This has earned it the title of 'Little England'.

These first settlers claimed the right of Englishmen overseas to be free. Only 12 years after they had landed, they and the pioneers who had since joined them set up the island's first parliament, modelled on that of England. Today Barbados has full internal self-government, with an elected House of Assembly, a Barbadian Premier, and a Governor representing Her Majesty the Queen, whose powers are restricted almost entirely to exercising the Royal prerogatives.

Bridgetown, the capital, is a very British town, and has a Trafalgar Square complete with a statue of Lord Nelson (27 years older than the one in London). Indeed, English placenames abound in Barbados, and cricket is the national game. Almost as soon as they can walk, Barbadian boys learn the game with a crude bat cut from a palm leaf, and a 'tar' ball. The island has produced some famous cricketers, including the three 'W's' – Worrell, Weekes, and Walcott – and Garfield Sobers, Wesley Hall, and Conrad Hunte.

Plantations

The early settlers were, for the most part, gentlemen farmers and their servants. They cleared the forests and established smallholdings of food-producing plants, obtained from Guiana, and of cotton and tobacco. At first the economy of the island was based on tobacco, but the rapidly increasing production of this crop in the American colonies, and the heavy export duty imposed on Barbadian tobacco, caused the trade to decline. Then in the 1640s Portuguese merchants introduced the sugar cane, which flourished in the fertile soil, and this was soon cultivated on a large scale. With the increasing European demand for sugar the economic destiny of Barbados was secured. But who was to perform the back-breaking labour of planting and harvesting the waving fields of canes under the tropical sun?

The geographical position of Barbados

The answer to this question was found on the west coast of Africa, from which negro slaves were shipped to work on the plantations. By the time that slavery was abolished in 1843 there were hundreds of thousands of negroes in the Caribbean, and their descendants form the greater part of the population of the West Indies today.

The island today

Today sugar is cultivated over most of the island, and 22 factories produce an average of 170,000 tons a year (in 1957 over 200,000 tons were produced – equivalent to nearly one ton for every person living on the island). The growing and export of sugar, and the manufacture of its valuable by-products of molasses and rum, are the island's major industries and source of revenue. Other exports include margarine, lard, edible oils, and soap.

Tourism is the island's second largest source of revenue. In 1962 Barbados catered for 44,000 visitors from America, Canada, Venezuela, the other Caribbean islands, and the United Kingdom. The island has an international airport at Seawell, to and from which six international airlines operate scheduled services; Barbados is 11 hours' flying time from London by jet aircraft, and $4\frac{1}{2}$ hours from New York. Spacious hotels have been built to accommodate visitors.

In 1961 a new £4 million deep-water harbour was opened, with moorings for eight ocean-going ships, and extensive bunkering facilities. Many tourists come to the island by sea, some disembarking, for a short stay, from the big luxury cruise liners.

The old harbour, or careenage – an inlet of the sea which runs right into Bridgetown spanned by two old bridges – still teems with schooners, trading vessels, and craft of all types and sizes, and the quayside is thronged day in and day out with bustling polyglot humanity. Ships can be seen here *careened*, or heeled over on their sides, being scraped, repaired, caulked, and repainted, as they have been for centuries. Both harbours are patrolled by the Harbour Police, dressed as sailors of Nelson's day, in white blouses, bell-bottomed trousers, and wide-brimmed straw hats.

Bathsheba; this lovely bay and its surroundings are typical of the scenery which attracts tourists from all over the world to Barbados

MAP PROJECTIONS

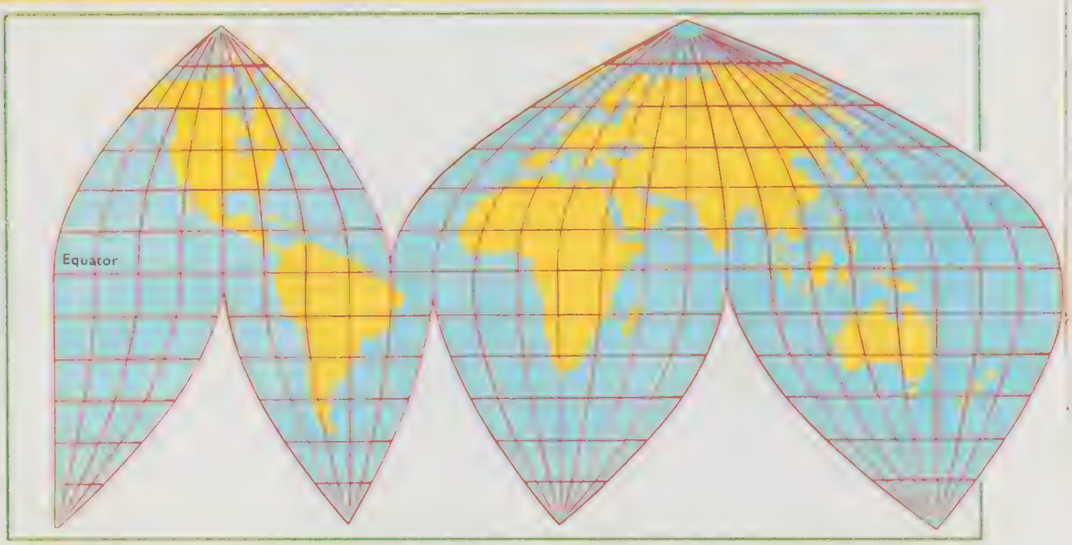


Diagram A. An interrupted sinusoidal projection – an equal area map designed to show the whole world without excessive distortion

BECAUSE the earth has a nearly spherical shape, the only correct representation of it at a small scale is by means of a globe. No flat map can provide a perfect picture of the earth because its curved surface cannot be fitted on to a plane surface. Just as we cannot flatten a rubber ball without stretching or tearing it, we cannot make a map of the earth without introducing some kind of distortion, equivalent to stretching or tearing. We can introduce these distortions in an infinitely large number of ways; they will all produce some kind of map projection, but none of them is perfect.

The choice of the most suitable projection for a particular map depends upon several factors such as the position, shape, and size of the area to be shown, as well as the purpose of the map. A large-scale map will show only a comparatively small part of the earth's surface, and therefore the distortions will be small. A very small-scale map of the whole world is the most difficult kind of map to design because the entire curved surface must be shown. The effect of 'tearing' is to make an artificial break or edge to the map whereas the earth's surface is continuous (see diagram A). The effect of 'stretching' is to alter the scale of the map so that this varies from place to place, or in different directions at the same place.

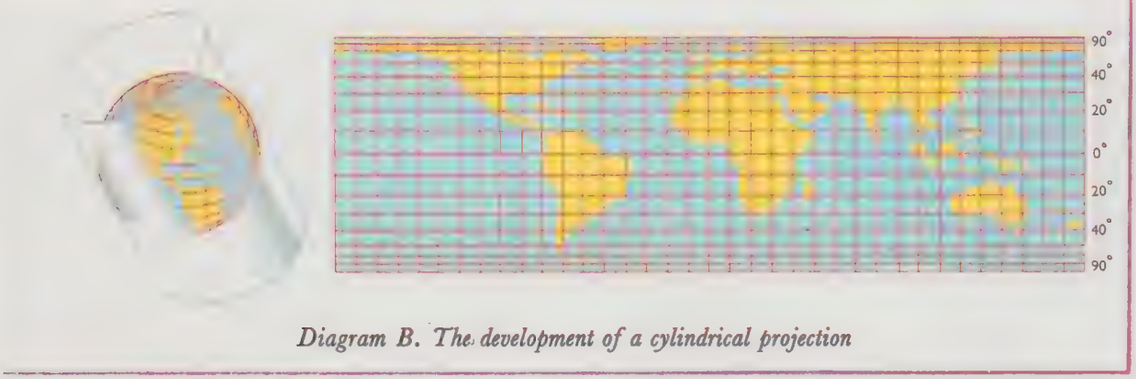


Diagram B. The development of a cylindrical projection

But the amount of distortion on a map can be regulated in two main ways. First, we can draw a picture of the earth which is true to scale at one point or along certain lines on the map. This can be done if we imagine a map sheet placed over a globe in one of three different ways.

The first way may be thought of as holding the flat sheet of paper so that it touches the globe at only one point. This creates a *tangent plane* upon which a circular or *azimuthal projection* can be constructed (see diagram D on the next page). In this, true scale is preserved at one point only – the geometrical centre of the projection.

Another method is to imagine the map sheet wrapped round a great circle on the globe (such as the Equator); this gives a rectangular or *cylindrical projection* (see diagram B). In a simple cylindrical projection true scale is preserved along the Equator only. The third possibility is to wrap the map sheet around a small circle (such as a parallel of latitude) to form a cone. The result is a fan-shaped or *conical projection* (see diagram C). In a simple conical projection true scale is preserved only along this parallel of latitude, known as the *standard parallel.*

Map distortion can also be controlled by keeping certain mathematical properties or rules in the projection. The two which are most valuable are the correct representation of all angles in the map and the correct representation of all areas on the map. But these two properties are mutually exclusive – that is, they cannot both be included in one map. In a map showing angles correctly (a *conformal projection*) the scale changes equally in all directions so that all the angles are correct but the lands and oceans are considerably distorted. In an *equal area projection* the lands are shown correctly but the angles are distorted.

The two ways of controlling distortion can be combined to give projections such as the *conformal conical* or the *cylindrical equal area projection.*

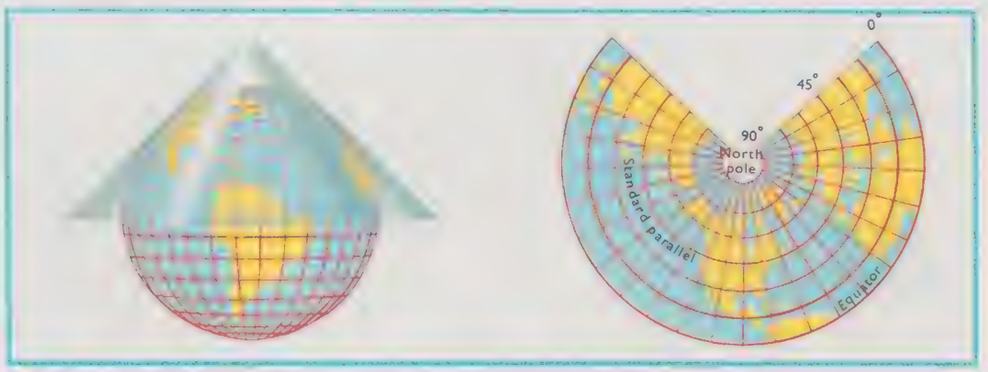


Diagram C. The development of a conical projection

Diagram D.

AZIMUTHAL PROJECTIONS

A circular projection is obtained by holding the plane surface of a map sheet at a tangent to a point on the globe.

A simple practical demonstration of this (diagram D) can be achieved by the use of a transparent globe and a light. Instead of a flat sheet of paper we can use a plane sheet of ground glass held against the globe. The light shines through the globe and projects the lands and oceans marked on its surface on to the sheet of glass. These projections are always circular. Depending on the position of the light, a variety of different azimuthal projections can be produced. A stereographic projection is produced when the light is situated at a point diametrically opposite the place where the sheet of glass touches the globe.

The orthographic projection (diagram F) results if the light source is infinitely far from the globe.

It is important to note, however, that not all azimuthal projections can be obtained in this way but must be designed mathematically.

The distortions of map projections

We have seen that only one of the two important mathematical properties can be preserved in any map projection – distortion of area is always present in a conformal projection, and distortion of angles occurs in an equal area projection. In an arbitrary projection, which is neither conformal nor equal area but drawn without using any of the principles or rules we have described, both angles and areas are distorted (see diagram E below).

The way in which the distortions increase is most important to the selection of the right map projection for a particular country. In azimuthal or circular projections distortion increases outwards from the centre; in cylindrical or rectangular projections the distortion increases northwards and southwards from the line representing the Equator; in conical projections distortion increases outwards from the standard parallel.

The effect of these distortions is probably best illustrated by showing the same picture of a man's head as it would appear on some well-known projections. All are distorted to a greater or lesser degree, but this distortion is particularly noticeable on Mercator's projection (the cylindrical conformal projection). Because it is cylindrical, this projection has a rectangular shape. To achieve this, all parallels of latitude have to be drawn the same length as the Equator, even though they are in fact shorter. This produces an east-west stretch, or distortion, that increases towards the poles. At the same time, this is a conformal projection, so that the scale at each point on the map must be the same in every direction; the north-south scale must therefore be stretched to the same extent as the east-west scale. The result is that the northern and southern areas of the map are drawn to a much greater scale than those in the middle. The man's head is therefore enlarged at his neck and chin and on the crown of his head, while his eyes and nose are more correctly represented.

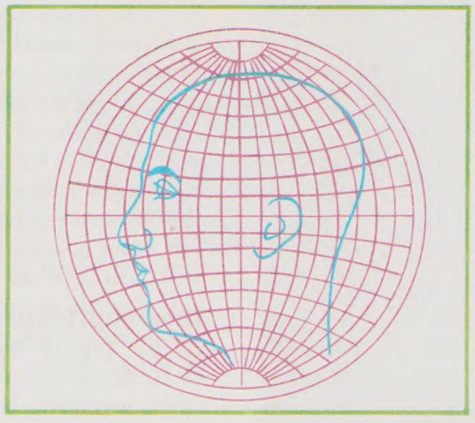


Diagram E. Man's head drawn on a globular projection

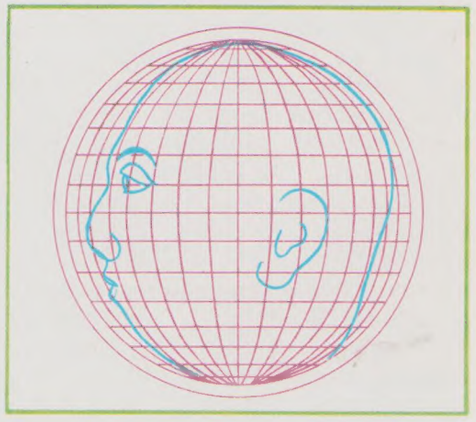


Diagram F. Man's head plotted on an orthographic projection

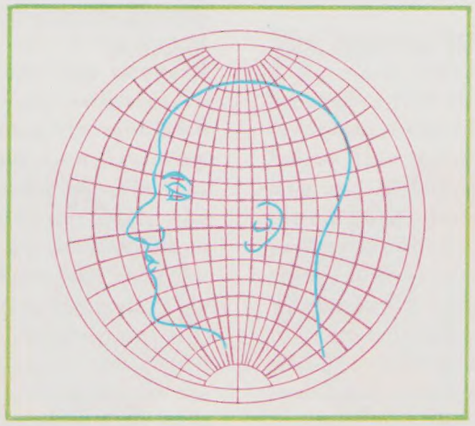


Diagram G. The same head drawn on a stereographic projection

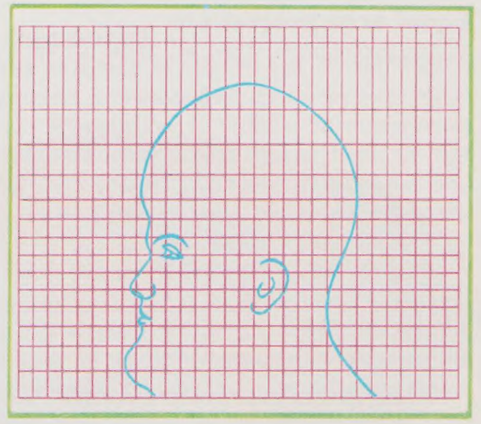


Diagram H. When Mercator's projection is used the distortion increases away from the centre

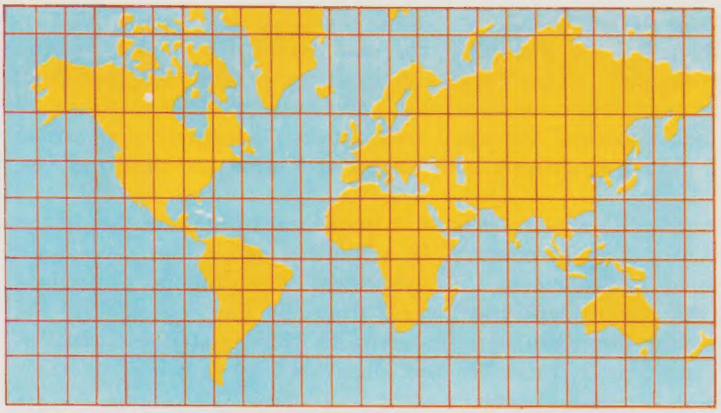


Diagram I. Mercator's projection

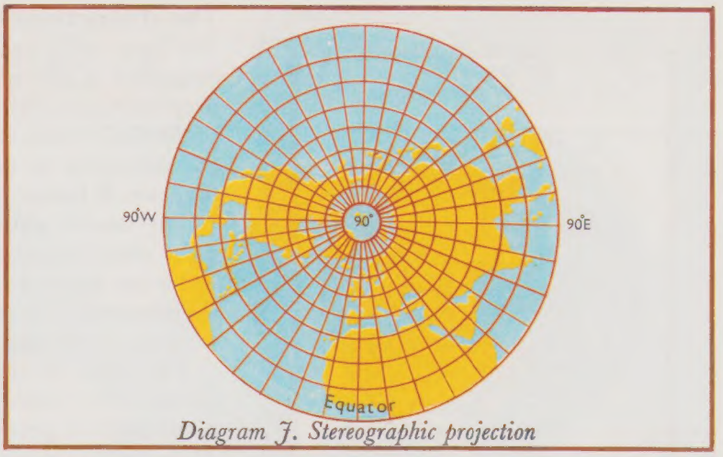


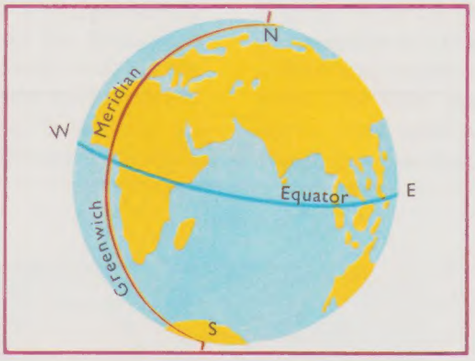
Diagram J. Stereographic projection

Map projections for special purposes

Four different projections which are in common use are illustrated on this page. The pair at the top of the page (diagrams I and J) are conformal projections; the pair at the bottom of the page (diagrams K and L) are equal area maps.

Conformal projections

These projections (in which all angles are correctly drawn) are normally used for topographical maps (that show physical features and elevation in detail), military maps, and navigation charts. This is because surveyors, soldiers, and navigators need to measure angles and plot these accurately. Therefore they must use a map in which all angles are shown without distortion.



There is a conformal (sometimes called orthomorphic) projection in each of the three classes of projection which have been described (azimuthal, cylindrical, and conical). The conformal azimuthal projection is the circular map known as the *stereographic projection* (diagram J). This was designed by the Greek mathematician Hipparchus in about 150 B C. It is used today mainly for aerial navigation in polar regions. The conformal cylindrical projection, known as *Mercator's projection*, is named after its inventor and dates from 1569. Ever since that time it has been used for marine navigation charts. A modified form of it, known as the *transverse Mercator projection*, is used as the basis for most topographical maps, such as Ordnance Survey maps (see pages 1130–1131).

Equal area projections

These projections show all areas correctly, to the same scale. They are suitable for maps which show (for example) the distribution of crops, people, types of vegetation, and so on, in either a single continent or the whole world. One of the simplest of these is the cylindrical equal area projection (see diagram B on page 2366) which was invented by the German mathematician Lambert in the 18th century. But even this gives a somewhat unrealistic picture of the world; the lands lying to the extreme north and south look compressed because they have been drawn to a much smaller scale. Many of the distribution maps which appear in atlases are prepared on more complicated equal area projections such as the two illustrated below: Mollweide's projection (diagram K) and the Nordic projection (diagram L). Both of these have been designed to fit an equal area projection of the whole world into an ellipse with one axis (the horizontal one) twice the length of the other (vertical) axis. In such projections the parallels and meridians are curves which intersect each other at acute angles; in reality they are always perpendicular to each other, intersecting at right angles.

Interrupted projections

At the top of page 2366 (diagram A) is another example of an equal area map of the whole world, an *interrupted sinusoidal projection*. In its simplest form it looks rather like the Mollweide projection (diagram K); the parallels and meridians intersect at increasingly acute angles towards the edges of the map, making the continents more and more distorted. In order to reduce this distortion as much as possible, the map is interrupted – that is, divided into a series of connected *sinusoidal projections*.

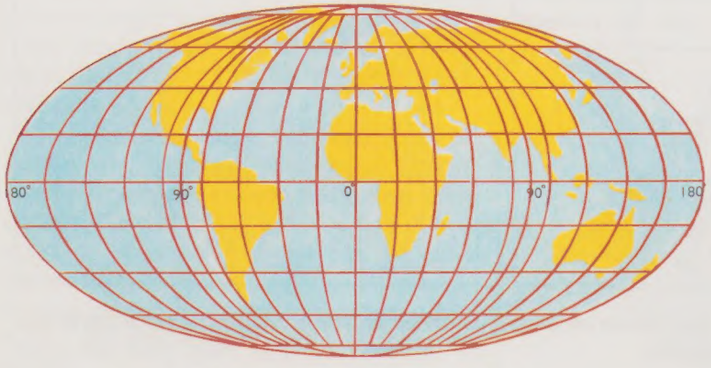


Diagram K. Mollweide's projection

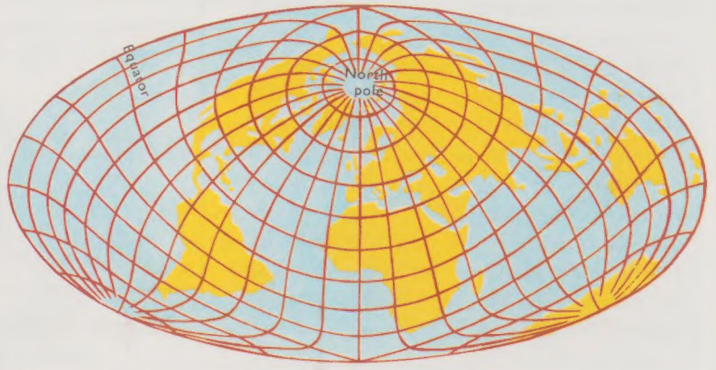


Diagram L. Nordic projection designed by John Bartholomew about 1951

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detail in case it might be of value at some later date, that archaeologists began to realise the importance of careful excavation.

Until then, almost the only sites excavated were burial mounds. The General showed that it was just as important to dig the villages and camps of ancient man if you wanted to know how people had lived in those days. Since the General's time, sites of every kind and description have been investigated, and we will now describe some of the major discoveries.

A site discovered from the air

During December 1925, Squadron Leader Insall, V C, was flying at about 2,000 feet over Stonehenge when he noticed a circle about 250 feet in diameter with white chalk marks in its centre, two miles away at Durrington. The following July, when the wheat was high over the site, five or six rings of spots could be seen surrounded by a wide band of dark corn. The spots could be recognised as filled-in holes for posts, and the dark band of corn as a surrounding ditch. In August 1926 excavation began. Within five weeks the socket-holes of five concentric rings of timber posts were found. Each of these must have held posts between 1 foot and 3 feet in diameter, which probably formed part of a roofed wooden temple, with a central open court, built towards the end of the Neolithic period (2000 B C). Slightly south-west of the centre a grave was found, containing the skeleton of a 3-year-old child. The baby's skull had been smashed and it seemed to have been buried as a sacrifice. Since the temple was of wood and was rather like Stonehenge, it has become known as Woodhenge. Concrete blocks marking the site of the wooden posts can be seen beside the Upavon to Amesbury road in Wiltshire. This was one of the first sites to be discovered from the air, and was the first timber circle to be found in Britain. Four years later Squadron Leader Insall discovered a second similar circle at Arminghall, close to Norwich.

Maiden Castle

In 1934 Sir Mortimer Wheeler began work on the great prehistoric fortification, Maiden Castle, near Dorchester in Dorset. Up to that time nothing was known about one of the largest hill-forts in Britain. Beneath its massive Iron Age ramparts Wheeler found a Neolithic enclosure of 2,000 years earlier, and a burial mound a third of a mile long containing the mutilated body of a young man. 1600 years later a small Iron Age camp with stone-faced walls had been built on the same hill. This was conquered by refugees from Brittany two centuries later, who enlarged it to its present size. The final attack by the Romans on the eastern gate in A D 44 was clearly and dramatically shown in the excavations. After an initial barrage from catapults, the Roman infantry advanced on the entrance, slaughtering as it went. Huts outside the gate were burned, and under cover of their smoke the gates were stormed. A massacre ensued before the gates were eventually demolished and the camp taken. Only from the most skilled excavation could this amount of information have been pieced together.

The Roman Temple of Mithras, found on a building site in the City of London; thousands queued to see it

The Sutton Hoo ship burial

A few weeks before the outbreak of the Second World War in September 1939 the greatest archaeological discovery ever made in Britain occurred near Woodbridge in Suffolk. In a barrow at Sutton Hoo the remains of a clinker-built Saxon boat, 89 feet long and 15 feet wide, were found. The wood of the boat had rotted away, leaving only lines of iron rivets to mark the position of the planks of the original boat. These showed up clearly in the yellow sand, but made the excavation of the boat extremely difficult and delicate work. A small wooden chamber in the centre of the ship contained a wonderful treasure which included a helmet and coat of mail, jewelled epaulets, an iron sword and shield with jewelled fittings, ten silver bowls, silver-mounted drinking horns and a great silver dish, golden purse mounts and buckles, cauldrons, spears, and many other objects. Everything pointed to a royal grave, but no body was found in

No. 148 Volume 13

Knowledge

Printed in Great Britain by Purnell & Sons Limited
Paulton, Nr. Bristol

Published by arrangement with
Fratelli Fabbri Editori
Milan

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Archaeology (part two) *Cover*
Elizabeth Fry *2353*
Paris (part two) *2354*
David and Solomon *2356*
Uranium *2358*

contents

The weasel family *2359*
Byzantine Constantinople *2362*
Barbados *2364*
Map projections *2366*

contents

the excavation. Probably the boat and its contents had been buried as a cenotaph or memorial to a king who was perhaps drowned at sea.

Treasure trove

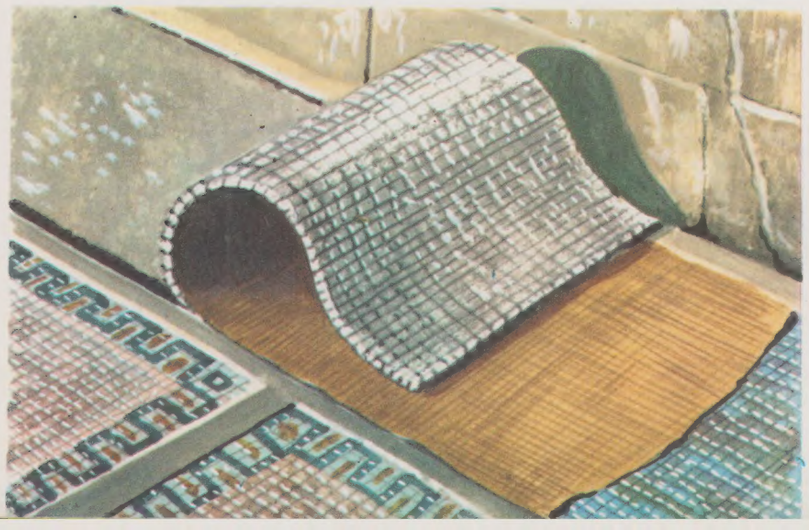
Once the Sutton Hoo treasure had been found, the question of who owned it arose. When gold or silver is found after being hidden in Britain it is declared *treasure trove* (the law is slightly different in Scotland). A coroner's inquest has to be held to decide whether the articles have been hidden in the ground by people who intended to recover them again later or whether they have been willingly placed in the ground by people who have no intention of coming back for them, as in the burial mound at Sutton Hoo. In the first case, if the owner or his descendants cannot be traced the objects become the property of the Crown and the finder is paid their full value. In the second case they become the property of the owner of the land. At Sutton Hoo the land owner was Mrs E. M. Pretty, who by an act of great generosity presented the whole treasure, valued at many thousands of pounds, to the nation. It can be seen today in the British Museum.

The Temple of Mithras

If you had been in London during the last week of September 1954 you might have been one of the 15,000 people who daily visited the site of the Roman temple that had been discovered between Queen Victoria Street and Cannon Street in the City. A team of archaeologists were excavating ground that was soon to be covered by a 14-storey office block. A carved stone head of the god Mithras, the bull-slayer and god of light, was uncovered in the foundations of a Roman building measuring 60 feet by 20 feet. The building was not unlike a Christian church with side aisles and an apsed end. It was identified as a temple in which the god Mithras had been worshipped. It had been used between A D 150 and 300.

For some strange reason the discovery attracted the attention of the public, and for a fortnight immense crowds of people queued to see the remains of the building. Many of them pressed for the building to be saved, and the owners agreed to have it dismantled stone by stone and re-erected in the forecourt of their new building, Bucklersbury House, where it can now be seen at any time.

Removing a mosaic intact – one of the many skills required for successful archaeology



A marble head of the Roman god Mithras, found during the excavation of the temple

British archaeologists abroad

It is not only in England that British archaeologists have made great discoveries. Sir Flinders Petrie in Egypt and Sir Leonard Woolley in Mesopotamia made finds which revolutionised our knowledge of the ancient world. In 1900 Sir Arthur Evans began excavating at Knossos on the island of Crete in the eastern Mediterranean. There, over the next 25 years, he uncovered a great palace covering 5½ acres – the home of King Minos. Not only did Evans find a palace as big as Buckingham Palace, but he also discovered a great unknown Bronze Age civilisation which he called Minoan, which spread from Crete to Greece 2,000 years before Christ.

Tutankh-amen

The greatest archaeological discovery of the 20th century was that of the tomb of the pharaoh Tutankh-amen, discovered in November 1922 in the Valley of the Kings near Luxor in Egypt by Howard Carter and Lord Carnarvon. This was the first tomb to be found in the Valley that had not been robbed in recent times.

The tomb consisted of four chambers. In one of these stood a golden shrine in which lay the preserved body (mummy) of the king, enclosed within four coffins: one of stone, two of wood, and one of gold. The other rooms were filled with wonderful things: golden couches, a gilded throne, statues, vases, wreaths – everywhere the gleam of gold. These priceless objects are now in the national museum in Cairo where they give a wonderful impression of the treasures of an Egyptian king of the 14th century B C. The body of Tutankh-amen has been returned to his tomb, while the records of the excavation and thousands of photographs taken at the time are in the Ashmolean Museum in Oxford.